

CLAIMS

We claim:

- 1 1. A polymer electrolyte comprising:
2 a modified polymeric material, said modified polymeric material including a
3 halogen containing polymer having an enhanced halogen level, said enhanced halogen level
4 relative to a halogen content of said halogen containing polymer formed from polymerization of
5 its monomer;
6 a salt of an alkali metal; and
7 an aprotic solvent, wherein said salt and said aprotic solvent are integrated with
8 said modified polymeric material.
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21 2. The polymer electrolyte of claim 1, wherein said halogen containing polymer
2 includes at least one chlorine containing polymer.
- 1 3. The polymer electrolyte of claim 2, wherein said chlorine containing polymer is
2 polyvinylchloride (PVC).
- 1 4. The polymer electrolyte of claim 3, wherein said polyvinylchloride (PVC) is
2 suspension polyvinylchloride (PVC).

1 12. A rechargeable battery, comprising:
2 an anode containing an alkali metal;
3 a cathode; and
4 a polymer electrolyte formed from a modified polymeric material, said modified
5 polymeric material including a halogen containing polymer having an enhanced halogen level,
6 said enhanced halogen level relative to a halogen content of said halogen containing polymer
7 formed from polymerization of its monomer, a salt of an alkali metal and an aprotic solvent,
8 wherein said salt and said aprotic solvent are integrated with said modified polymeric material.

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11 13. The rechargeable battery of claim 12, wherein said halogen containing polymer
12 comprises at least one chlorine containing polymer.

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14 14. The rechargeable battery of claim 13, wherein said modified polymeric material
15 comprises chlorinated polyvinylchloride (C-PVC).

16 15. The rechargeable battery of claim 12, wherein in said anode comprises lithium.

17 16. The rechargeable battery of claim 12, wherein said anode comprises a lithium
18 alloy.

1 17. The rechargeable battery of claim 16, wherein as said lithium alloy is at least one
2 selected from the group consisting of lithium-aluminum, lithium-aluminum-silicon, lithium-
3 aluminum-cadmium, lithium-aluminum-bismuth and lithium-aluminum-tin.

1 18. The rechargeable battery of claim 12, wherein said anode comprises a lithium-ion
2 material.

1 19. The rechargeable battery of claim 12, wherein said cathode comprises a metal
2 oxide.

1 20. The rechargeable battery of claim 12, wherein said cathode comprises a lithium-
2 transition metal oxide.

1 21. The rechargeable cell of claim 12, wherein said cathode is at least one selected
2 from the group consisting of MnO_2 , LiMn_2O_4 and vanadium oxides (V_xO_y).

1 22. The rechargeable cell of claim 12, wherein said cathode comprises a organic
2 polymer.

1 23. The rechargeable cell of claim 12, wherein said cathode is at least one selected
2 from the group consisting of polyviologen, polyacetylene and polypyrrole.

1 29. The method of claim 28, wherein said chlorine containing polymer comprises
2 polyvinylchloride (PVC).

1 30. The method of claim 29, wherein said polyvinylchloride (PVC) is suspension
2 polyvinylchloride (PVC).

1 31. The method of claim 29, wherein said polyvinylchloride (PVC) is emulsion
2 polyvinylchloride (PVC).

1 32. The method of claim 27, wherein said modified polymeric material comprises
2 chlorinated polyvinylchloride (C-PVC).

1 33. The method of claim 32, wherein said halogenation comprises chlorination, said
2 PVC being chlorinated by a process of homogeneous or heterogeneous chlorination.

1 34. The method of claim 27, wherein said blending step includes comprises addition
2 of a volatile solvent.

1 35. The method of claim 34, further comprising the step of removing said volatile
2 solvent.

- 1 36. The method of claim 35, wherein said removing step comprises vacuum
2 processing at room temperature.

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